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DISCUSSION

THE REALITY BEYOND: SYNCHRONICITY VS. COMPLEMENTARITY

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Abstract. As an alternative for causality – which modern science found to be rather construed than objective – Jung developed his idea of synchronicity according to the demands of a modern scientific approach of nature. As I will show in the following paper, even if he promised a complementary principle of explanation, he ended by offering a principle of reality. His attempt gave birth to a pretty vast literature that links Jung's synchronicity to Bohr's complementarity. I will show that such a connection, although not entirely groundless, should be treated with caution as long as the two approaches of reality are on completely different bases.

Key words: Jung, Bohr, causality, the measurement problem, quantum epistemology.

In his last extended account on synchronicity appeared in the form of a monograph published in 1952[1], Jung started an apparently collateral debate concerning the limits of scientific experiments. Though science aims to comprehend the wholeness of nature, its purpose remains forever out of reach. The goal-blocking obstacle is none other than its prime mode of inquiry, i.e. the experimental method. According to Jung, the experimental setup is an artificially created layout that imposes on nature a set of restrictions and compels it to behave within the imposed boundaries. The experiment and its results are viewed by Jung in terms of questioning and answering, respectively, – a situation where man is asking nature for a specific response. But if the answer is intended to be precise, then the question itself must be well-defined. This limitation of nature results in an equally limited response.

In Jung's terms,

> This grasping of the whole is obviously the aim of science as well, but it is a goal that necessarily lies very far off because science, whenever possible,

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[1] *Naturerklärung und Psyche* (Studien aus dem C. G. Jung-Institut, IV; Zurich, 1952). Jung's monograph was later included in Vol. 8 of the *Collected Works* (1960).

> proceeds experimentally and in all cases statistically. Experiment, however, consists in asking a definite question which excludes as far as possible anything disturbing and irrelevant. It makes conditions, imposes them on Nature, and in this way forces her to give an answer to a question devised by man. She is prevented from answering out of the fullness of her possibilities since these possibilities are restricted as far as practicable. For this purpose there is created in the laboratory a situation which is artificially restricted to the question and which compels Nature to give an unequivocal answer.[2]

The scientific experiment is thus a *narrowed-down question* that demands for an *accurate answer*. From such a limitative inquiry one cannot expect to gain knowledge of nature in its whole. Jung thought there might be a right way to ask questions so that the answers would come from the whole nature and not merely from some trivial pieces of it. To this end, he suggested to resort to an inquiry method that imposes to nature the "fewest possible conditions" (or no conditions at all)[3]. On such a basis, he started to develop his synchronicity as an alternative account on reality that should be seen as a complementary principle of explanation to the causal view of classical science.

Jung seems to imply that the compromising of causality in modern physics calls for a change of approach with which we should regain control of our *entire* world. My intent with this brief account is to argue that what Jung challenged with his wholeness requirement was not so much a certain method of inquiry, as a particular model of reality. With this goal in mind, I will discuss both Jung's alternative experimental method and model of reality as they emerge from his latest extended essay on synchronicity while browsing the scientific literature of his time concerned with the metaphysics of quantum mechanics. Such a glance at the metaphysics of scientists – though sketchy – might be useful if we take into account Jung's frequent allusions to the discoveries of modern physics as a potential support for his concept of synchronicity.

Though there was an overwhelming consensus among physicists in what concerns quantum mechanics formalism, the metaphysical interpretations of the results couldn't be more different. While not stated openly, Jung's special interest in the Copenhagen interpretation was clear from the beginning as he mentioned the indeterminism and orientation of modern physics towards a "statistical truth" at the subatomic level. Both ideas are found in detail in Bohr's writings and are closely related to what Bohr defined as the "quantum postulate" and complementarity

[2] C.G. Jung, *Collected Works*, 8: 864, in *Synchronicity, an Acausal Connecting Principle*, with a new Foreword by Sonu Shamdasani, translated by R.F.C Hull, Princeton and Oxford, Princeton University Press, p. 35. A similar idea was briefly put earlier, at page 821 of the *Collected Works* (in *Synchronicity…*, p. 6).

[3] "If we want to know what these workings are [the workings of Nature in her unrestricted wholeness], we need a method of inquiry which imposes the fewest possible conditions, or if possible no conditions at all, and then leaves Nature to answer out of her fullness". *Collected Works*: 864, in *Synchronicity*…, p. 35.

principle[4]. It appears that Jung and Bohr have never actually encountered each other in person, but Jung was definitely familiarized with Bohr's epistemological standpoint – through his friend Pauli unless otherwise, in whose shared thoughts Bohr was always a weighty figure. Also, Jung made repeated references to Bohr, directly or not, one of those being particularly significant due to the resemblance he found between Bohr's model of the atom and his own notion of archetype[5].

The most important achivement in Jung's theory of synchronicity is the coining of *acausal connections*. The story of how he came to see the requirement of a synchronistic explanation of events is rather quick. He noticed there are concurrent events that apparently cannot be linked together by causality – as simple as that. For example, a patient of his was sharing her dream of a golden scarab when a flying scarab-like beetle was knocking at the window and eventually was let inside[6]. A mother took a picture of her little boy in the Black Forest, then left the film in Strasbourg to be developed. The war broke out and the film was lost. Two years later, the same mother bought a film in Frankfurt in order to take a photo of her newly born girl. Once developed, it revealed a double exposure: beneath the recent photos were those taken two years ago[7]. While at a party in Gotenburg, Swedenborg had a vision of a huge fire that had just erupted at Stockholm and told his companions the precise details of the extending calamity. Oddly enough, a real fire occurred in Stockholm at the same time, exactly as described by the seer[8].

According to Jung, such coincident events couldn't be explained by appealing to causality. Synchronicity was therefore developed as a principle of explanation for this class of phenomena and was described as

> a coincidence in time of two or more causally unrelated events which have the same or a similar meaning […]. Synchronicity therefore means the simultaneous

[4] See for example Niels Bohr, "The Quantum Postulate and the Recent Development of Atomic theory", *Nature* (Supplement), No. 121 (April 14, 1928), pp. 580–581, and "On the Notions of Causality and Complementarity", *Science*, New Series, Vol. 111, No. 2873 (Jan. 20, 1950), pp. 51–54;

[5] "Effects can be empirically established whose cause is described hypothetically as *archetype*, just as in physics effects can be established whose cause is assumed to be the *atom* (which is merely a model). Nobody has ever seen an archetype, and nobody has ever seen at atom either. But the former is known to produce numinous effects and the latter explosions. When I say 'atom' I am talking of the model made of it; when I say 'archetype', I am talking of ideas corresponding to it, but never of the thing-in-itself, which in both cases is a transcendental mystery. It would never occur to a physicist that he has bagged the bird with his atomic model (for instance Niels Bohr's planetary system). He is fully aware that he is handling a variable schema or model which merely points to unknowable facts." Letter to Haberlandt, 23 April 1952, in G. Adler (ed.), *C.G. Jung Letters*, Vol. II: 1951–1961, London, Routledge, 1990, p. 54.

[6] C.G. Jung, *Collected Works*, 8: 843, in *Synchronicity…*, p. 22.

[7] Jung found this story in Wilhelm von Scholz. C.G. Jung, *Collected Works*, 8: 831, in *Synchronicity…*, p. 15.

[8] Swndenborg's case is largely known thanks to Kant's early work *Dreams of a Spirit-Seer – Illustrated by Dreams of Metaphysics*, cited by Jung. C.G. Jung, *Collected Works*, 8: 912, in *Synchronicity…*, p. 65.

> occurrence of a certain psychic state with one or more external events which appear as meaningful parallels to the momentary subjective state – and, in certain cases, vice versa[9].

Thus, synchronicity consists of two elements: first, an unconscious image comes into consciousness either openly, or disguised (in a symbolically encrypted form) – as a dream, idea, or premonition; and second, an objective situation overlaps with this content[10]. If causality is a relationship between two events – "cause" and "effect" – of which the former is held responsible for the latter and the latter is understood as dependent on the former, synchronicity is a relationship where no such dependency linkage is seen, nor required. Though there is a relationship between the two events, this is not enforced by a cause–effect agency. What links the synchronistic events is *meaning*. I will return to this issue later. However, a "meaningful coincidence" must be distinguished from a mere coincidence – the latter being no more than an accident, a "lucky hit"[11] or the expression of a causal relationship yet undiscovered. If we are looking for a sharp criterion to distinguish between a meaningful and a pure coincidence we'll be disappointed. First, Jung considered the "statistical evaluation": if the incidence number of simultaneous events exceeds the limits of probability, we have to assume that we are dealing with synchronicity; if not, it's a question of chance[12]. But the statistical method by itself is not sufficient and not always leads to the goal. Besides the fact that the statistical view of the world is an abstraction that proves incomplete and inadequate when dealing with human psyche, the statistical method cannot do more than a quantitative assessment of synchronicity[13]. What about the isolated occurrences of coincident events like the ones mentioned before, that might need qualitative criteria? What about the personal experiences of this kind? "Statistics would not even make sense without the exceptions"[14]! An additional criterion is required.

> I therefore consider it a scientific duty to give as complete an account as possible of the result and to show how not only the statistical material, but the psychic processes of the interested parties, were affected by the synchronistic arrangement.[15]

The second and most valuable criterion offered by Jung is *meaning* – and it's just as reliable as an "anthropomorphic interpretation" can be[16].

[9] C.G. Jung, *Collected Works*, 8: 849–850, in *Synchronicity…*, p. 25.
[10] C.G. Jung, *Collected Works*, 8: 858, in *Synchronicity…*, p. 31. See also *Ibidem*, 8: 855, pp. 28–29.
[11] *Ibidem*, 8: 827, p. 11.
[12] *Ibidem*, 8: 821, p. 7; 8: 824, p. 8; 8: 828, p. 11,
[13] *Ibidem*, 8: 912, p. 64.
[14] *Ibidem*, 8: 904, p. 61
[15] *Ibidem*, 8: 907, p. 63.
[16] "Although meaning is an anthropomorphic interpretation it nevertheless forms the indispensable criterion of synchronicity." *Ibidem*, 8: 916, p. 69.

I'm less interested here in the difficulties that arise from the concept of synchronicity itself (such as the absence of strong trustworthy criteria for distinguishing the synchronistic events from pure chance) and more in what makes of it a useful alternative to causality, as the term was explicitly picked by Jung to describe a "factor equal in rank to causality as a principle of explanation"[17].

To back up his newly introduced concept, Jung resorted to the main breakthroughs of modern physics: Einstein's theory of relativity and quantum theory. It's widely known that he openly admitted his debt to Einstein's notion of relativity in shaping synchronicity as a "psychically conditioned relativity of space and time"[18]. The new idea of space and time was greatly helpful to Jung for a particular reason: with the Newtonian notions of absolute space and time, synchronicity as a coincidence of a psychic state with an objective, external event that corresponds to the psychic state in the absence of any causal connection is unthinkable. Swedenborg's vision of a fire occurring nearly 300 miles away could hardly be explained within the classical theory of space and time.

Besides the classical Newtonian understanding of space and time, there was another deep-rooted notion that needed to be challenged in order for synchronicity to be conceived as a flawlessly natural phenomenon – that of *causality*. This was not a difficult step to take once the absolute space and time were practically abolished with Einstein. This time, Jung's starting point is to be found in quantum physics, or, more precisely, in some of the early interpretations of its experimental results. His preference for the Copenhagen interpretation is obvious and easy to understand, since Jung was in need of a scientific background that would be a suitable match for his own principle of explanation. According to Bohr, the so-called quantum postulate (which speaks in terms of "essential discontinuity" in regard to the quantum processes, symbolized by Planck's quantum of action) implies the abandonment of the causal space-time coordination when dealing with atomic processes[19]. On Bohr's view, the description of quantum phenomena seems to be impossible in classical terms. Classical physics failed to account for atomic phenomena, and its failure is clearly shown in the wave-particle paradox. In his terms,

> we are faced with the necessity of a radical revision of the foundation for description and explanation of physical phenomena[20].

[17] *Ibidem*, 8: 840, p. 19.

[18] In a letter to Carl Seelig, Jung wrote: "Professor Einstein was my guest on several occasions at dinner. […] It was Einstein who first started me off thinking about a possible relativity of time as well as space, and their psychic conditionality. More than thirty years later this stimulus led to my relation with the physicist Professor W. Pauli and to my thesis of psychic synchronicity." *C.G. Jung Letters*, II, p. 109. See also *Collected Works*, 8: 840, *Synchronicity…*, p. 19.

[19] N. Bohr, "The Quantum Postulate and the Recent Development of Atomic Theory", *Nature* (Supplement), No 121 (April 14, 1928), p. 580.

[20] Niels Bohr, "On the Notions of Causality and Complementarity", *Science*, New Series, Vol. 111, No. 2873 (Jan. 20, 1950), pp. 51–52; See also "The Quantum Postulate…", pp. 580–581: "This situation would seem clearly to indicate the impossibility of a causal space-time description of the light phenomena. On one hand, in attempting to trace the laws of the time-spatial propagation of light according to the quantum postulate, we are confined to statistical considerations. On the other hand,

The confinement of quantum physics to statistical consideration, as Bohr stated, is a direct consequence of what he called the quantum postulate[21].

The inability of physics to explain in classical terms (in a both causal and space-time description) certain properties of natural phenomena was perceived by Jung as a total relativisation of classical laws of nature. Encouraged by these circumstances, Jung wondered whether there may not be some field where acausal events not only were possible, but were proved to be actual facts[22]. The statistical method invoked by Bohr (and developed by Born) was also greatly echoed in Jung and propelled synchronicity in a *milieu* of legitimate science:

> The discoveries of modern physics have, as we know, brought about a significant change in our scientific picture of the world, in that they have shattered the absolute validity of natural law and made it relative. Natural laws are statistical truths, which means that they are completely valid only when we are dealing with macrophysical quantities. In the realm of very small quantities prediction becomes uncertain, if not impossible, because very small quantities no longer behave in accordance with the known natural laws. The philosophical principle that underlies our conception of natural law is causality. But if the connection between cause and effect turns out to be only statistically valid and only relatively true, then the causal principle is only of relative use for explaining natural processes and therefore presupposes the existence of one or more other factors which would be necessary for an explanation. This is as much as to say that the connection of events may in certain circumstances be other than causal, and requires another principle of explanation.[23]

The scientific explanation of our world should therefore begin with a criticism of our concepts of time, space and causality – as "hypostatized concepts" produced by the distinguishing activity of the conscious mind[24]; but not only that, for it should also make room for the unconscious in the big picture.

In a tone reminiscent of Bohr's complementarity, Jung admitted that his principle is coexistent with that of causality, which would remain valid in the physical (macroscopic) realm. The complementary principle of synchronicity came to complete a full description of reality. The apparent resemblance between Bohr and Jung in this regard was noticed by scholars, starting with some of Jung's close associates. Marie-Louise von Franz, for instance, suggested that the concept of complementarity coined by Bohr to explain the paradoxical dualism of wave and particle in quantum physics can also be applied to the relationship between

the fulfilment of the claim of causality for the individual light processes, characterised by the quantum of action, entails a renunciation as regards the space-time description."

[21] Niels Bohr, "The Quantum Postulate…", p. 581.

[22] C.G. Jung, *Collected Works*, 8: 822–823, *Synchronicity…*, p. 7.

[23] *Ibidem*, 8: 818–819, p. 5.

[24] *Ibidem*, 8: 840, pp. 19–20.

conscious and unconscious states of a psychic content. And she added: "This fact was discovered by Jung, but it was particularly elaborated by Wolfgang Pauli"[25]. Indeed, Pauli wrote a great deal on this topic[26] and unambiguously recommended Bohr's "complementarity" for its potential explanatory virtue in the field of psychology. Though used chiefly in physics, the term might be seen in analogy with the psychological terms "conscious" and "unconscious" in that any observation of unconscious material has an impact on the conscious contents[27].

There is an entire literature starting with Pauli – yet otherwise mostly in the analytical field of psychology – engaged in interpreting Jung through Bohr's complementarity[28]. Nonetheless, the Jung-Bohr analogy should stop at the point where a clarification of their respective notions of reality is needed.

They say, "If you want to see fear in a quantum physicist's eyes, just mention the words 'the measurement problem". Translated into philosophical terms, the measurement problem is a matter closely related to the subject/object distinction and, eventually, to a conception of reality. In short, the experimental results of subatomic physics in the early decades of the last century revealed an epistemologically uncomfortable situation. Basically, when it came to interpreting the results, the physicists that otherwise came to agree on mathematical formalisms failed to reach a consensus regarding the interpretation. The results in need of interpretation proved so bizarre that Richard Feynman, for instance, believed that they were impossible to explain in any classical way[29]. In a word, the experimental results of quantum mechanics seemed to indicate that the reality on the subatomic level depended on measurement, furthermore, that was *determined* by measurement.

Discussing the quantum indeterminacy, the puzzled physicists began to speak of particles that could be in two places at the same time, of photons that existed in all possible states simultaneously as well as of other such counterintuitive phenomena that were allegedly resembling the actual behaviour of matter at the sub-atomic level in the absence of measurement. The awkwardness increased with

[25] See Marie-Louise von Franz, "Some Reflections on Synchronicity" [1984], in *Psyche and Matter*, Boston and London, Shambhalla, 1992, pp. 145–146.

[26] For his opinions on complementarity and its application in psychology, see for instance "The Philosophical Significance of the Idea of Complementarity" in Wolfgang Pauli, *Writings on Physics and Philosophy*, eds. Charles Enz & Karl von Meyenn, Berlin, Springer Verlag, 1994.

[27] See also Pauli's unpublished paper "Modern Examples of 'Background Physics'", in C.A. Meyer (ed.), *The Pauli/Jung Letters: 1932–1958*, Princeton, Princeton University Press, 2001, p. 185.

[28] See, for instance, Marie-Louise von Franz, *Projection and Re-collection in Jungian Psychology*, Chicago and La Salle, Illinois, Open Court, 1995 [1978]; Berverley Zabriskie, "Jung and Pauli: A Meeting of Rare Minds", introduction to *The Pauli/Jung Letters: 1932–1958*, pp. xxvii–xlx; David Lindorff, *Pauli and Jung: The Meeting of Two Great Minds*, Quest Books, 2004.

[29] *The Feynman Lectures on Physics*, Vol. I: 37–1: "We choose to examine a phenomenon which is impossible, *absolutely* impossible, to explain in any classical way, and which has in it the heart of quantum mechanics. In reality, it contains the *only* mystery. We cannot explain the mystery in the sense of 'explaining' how it works. We will *tell* you how it works. In telling you how it works we will have told you about the basic peculiarities of all quantum mechanics".

the experimental confirmation of de Broglie's hypothesis in 1927, according to which all matter – not only light – behaved as both a particle and a wave. There were two leading interpretations of experimental results that were fighting for ascendency at that time: Einstein's and Bohr's. Taking a realistic stand, Einstein argued that particles had properties that existed independent of any measure. Bohr's stance was entirely different: the properties of a quantum system were considered to be undetermined until measured.

Now, according to some of his commentators – of which I partly quoted above –, as well as to his own brief hints, Jung welcomed Bohr's complementarity in his synchronicity project. Let us see how it fits in. I find there are two strong ideas at the core of synchronicity: 1. the splitting of our account on nature/reality in two distinct yet complementary stories, and 2. the restriction of causality to only one of them.

First of all, the wave-particle paradox that prompted Bohr to devise the complementarity principle is less related, in Bohr's idea, to actual *properties* of the light, and more to our *measurement* of them. What suggests his early writing on quantum postulate (in terms that remind us of Kant) is that any observation of atomic processes involves an interaction with the agency of observation. In other words, there cannot be established a clear boundary between the measuring instrument and the phenomenon that is measured. As a result,

> an independent reality in the ordinary physical sense can neither be ascribed to the phenomena nor to the agencies of observation.[30]

As long as any observation requires an interference with the course of phenomena, the reality measured by science is different from what it's called objective reality. That is to say, we can no longer ascribe to phenomena an objective existence[31]. The quantum mechanics does not provide us with an objective view on the quantum reality – that's what Bohr said while keeping his thought within the strict limits of an epistemological approach.

Jung also agreed that we don't speak of reality, but of models of interpretation. However, he went further and contemplated the idea of a transcendental kind of reality that is ultimately responsible for the synchronistic events. As the law of cause and effect (as well as other natural laws) proved to be merely statistical, we need to consider another possible way to explain the extraordinary occurrence of synchronistic facts. At this point, Jung took the ontological leap and the "meaning" which was referred to above as a criterion for

[30] Niels Bohr, "The Quantum Postulate…", p. 580.

[31] See Niels Bohr, The Atomic Theory and the Fundamental Principles Underlying the Description of Nature" [1929], in *Atomic Theory and The Description of Nature*, Cambridge, Cambridge University Press, 1961 [1934], p. 115.

synchronicity eventually attained the rank of a universal principle. The relationship between the two synchronistic events is thus established by a meaning that transcends both the experiencing subject and the objective event[32].

It appears that Jung started his inquiry as a pedantic scientist concerned with facts and concluded it as a daring metaphysician. As we could see, synchronicity is based on a set of assumptions so radically dissimilar to those of Bohr's. However unusual it may seem, the only way that Bohr's complementarity was useful for Jung's synchronicity was by providing a scientific cause for something that Bohr himself hesitated to do – glimpsing the reality beyond any possibility of measurement.

[32] "We are so accustomed to regard meaning as a psychic process or content that it never enters our heads to suppose that it could also exist outside the psyche. But we do know at least enough about the psyche not to attribute to it any magical power, and still less can we attribute any magical power to the conscious mind. If, therefore, we entertain the hypothesis that one and the same (transcendental) meaning might manifest itself simultaneously in the human psyche and in the arrangement of an external and independent event, we at once come into conflict with the conventional scientific and epistemological views. We have to remind ourselves over and over again of the merely statistical validity of natural laws and of the effect of the statistical method in eliminating all unusual occurrences, if we want to lend an ear to such a hypothesis. The great difficulty is that we have absolutely no scientific means of proving the existence of an objective meaning which is not just a psychic product. We are, however, driven to some such assumption if we are not to regress to a magical causality and ascribe to the psyche a power that far exceeds its empirical range of action." C.G. Jung, *Collected Works*: 915, *Synchronicity*…, pp. 66–67.